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AUTHOR Frelick, Alcy; van Naerssen, Margaret
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ABSTRACT

In this paper there is a description of and rationale for a cultural orientation for Chinese scientists going abroad for research and further study. The orientation provides (1) knowledge about and awareness of the foreign scientific culture, (2) experience in the foreign scientific culture through simulated events in a foreign language setting, and (3) participation in a content course as a means of combining the first two basic types of training. Of particular interest is the use of an introduction to western philosophy of science as content for a course conducted as a graduate seminar in the U.S., thus acquainting students with various approaches to science and education prior to going abroad. (Author)

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PROFESSIONAL CULTURAL ORIENTATION in ESP

Alcy Frelick Margaret van Naerssen

INTRODUCTION

Too frequently when people think of EST/ESP, they think of discourse analysis of oral or written texts, but there is potential for much more than that. Since it has become axiomatic that learning a language also involves learning about the related culture, would it then not be logical to assume that there is also a cultural component to ESP? The humanization of ESP through the inclusion of a cultural orientation to the relevant foreign scientific community may be an important area for future development. In this paper, a type of orientation program developed in an EST ppogram in the People's Republic of China for training scientists going abroad is presented. This program could serve as a model for the development of other such orientations in other situations.

While foreign scientists frequently have a passing acquaintance with scientific institutions and organizations in other countries through references in readings, the actual relationships and influences of these on science and society are frequently not clear. Even though scientists around the world can study the same phenomena of nature, the way they approach problems may differ for they are based on ways of thinking that are shaped to a large extent by their cultures through educational systems, philosophies and political systems. Scientists going to work for an extended period of time (one year or more) in another society need a special kind of orientation that is generally not a part of traditional culture courses. EST programs need to provide this specialized information in addition to language and general culture for scholars going abroad.

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BACKGROUND

In 1976 the Educational Commission for Foreign Medical Graduates made recommendations for a cultural orientation to American medical practice as a part of the orientation for foreign physicians coming to work in the U.S.A. These recommendations included: descriptions of health systems; relationships of personnel within the profession and of medical personnel to patients; information on attitudes towards pain, sickness, dying and death; ethical and legal responsibilities; and public accountability of physicians. These items can provide a model for developing topics appropriate to the needs of students involved

in other ESP programs.

The students of the Chinese Academy of Sciences/Graduate School English Language Center (GSELC) come from a variety of fields of research in the physical sciences including: physics, chemistry, biology, computer science, mathematics, meteorology, geology, and palentology. Following the model for foreign medical graduates, categories of cultural information of general applicability across many disciplines were chosen as the content aspect of the professional cultural orientation component.

Initially our focus was on informational topics alone; however, as other aspects of the program developed, it became clear that there was a deeper level of a conceptual nature which was also involved. Thanks to the presence and help of visiting scientists in China, to information from/about Chinese scholars in the U.S., and to the cooperative work of the Chinese and American staff members, professional cultural orientation has become more broadly defined for us. We have divided it into three types of training:

1. Knowledge about/awareness of the foreign scientific culture
2. Experience in the foreign scientfic culture through simulated events in a foreign language setting
3. Participation in a content course as a means of combining the first two basic types of training

This type of training has the additional advantage of providing natural language situations for the further development of language skills.

There are certainly many similarities between the professional life of scientists in China and in the U.S.; however, the structure and rules within which they work, the resources available to them, the situations and modes of communication, and, possibly, the approaches to scientific research may differ, creating cross-cultural problems in the professional realm.

KNOWLEDGE ABOUT/AWARENESS OF THE FOREIGN SCIENTIFIC CULTURE

The following are topics covered in the information part of the orientation:

1. Orientation to Western ways of approaching science
   a. Introduction to Western Philosophy of Science
   b. The difference between basic and applied research in the U.S. and China
   c. The communication needs and daily life of a physicist at an American university.

d. The differences in the expectations of Foreign scientists and American colleagues vis-a-vis joint research and study

e. Scientific exchange between the U.S. and China

2. Orientation to professional resources in the U.S.

a. Professional organizations

b. Professional conferences

c. Graduate schools for research and study

d. The use of computers and university computer centers

3. Orientation to the basic structure of science in the U.S.

a. Science and government

b. Structure and politics of research

c. Financial support of science

d. Decision-making in science policies

4. Controversial scientific issues/topics of special interest

a. Bio-ethics

b. Future of science

c. DNA research and the law

d. Environmental carcinogens

e. Childhood cancers

f. Overpopulation and the potential for Ecocide

g. Nuclear power plants

h. Energy alternatives

i. Food sources

j. Urban environmental concerns

5. Miscellaneous: Safety signs in laboratories

Most of the topics are covered in a daily listening series titled PLENARY. This course is intended to provide native speaker input in a relaxed setting without the pressures of exams, homework, or class exercises. Plenary lectures cover other topics as well including a series on Second Language Learning/Acquisition and another on dialectical variations in English. Lectures have been videotaped and new ones are being constantly added to the collection in the center. The collection includes videos produced by USICA as well as ones made at centers in China and in the U.S.

Some of the informational content is not covered in the Plenary course, however. Certain relevant articles are included in the Reading course or in assignments for Writing or Academic Communications. Information about Western Philosophy of Science is taught in a separate content course. All of these courses form a transition between the informational and experiential aspects of professional cultural orientation as defined previously.

EXPERIENCE OF THE FOREIGN SCIENTIFIC CULTURE

As a program of EST and EAP, the curriculum focuses on language skills and communication strategies for various scientific and academic settings. There is an attempt to simulate as many of the real-life situations as possible in a foreign language setting so that students experience them as part of their language training and cultural orientation. These settings/situations include: leading/participating in group discussions and seminars, teaching, making conference presentations (panel and poster), informal conversation (common means for exchange of information in university departments and at conferences), applying for advance study and research positions (forms, letters, resumes), journal and textbook reading (selecting appropriate strategies for different purposes), taking in-class essay exams, and writing scientific abstracts and research proposals in their own fields.

In participating in a number of simulated professional events, the students gain confidence and develop strategies for focusing presentations for difference audiences. Teacher and peer feedback promotes the development of the improved communicative use of grammatical forms already learned. This emphasis on language as a means of communication is a new notion for many of the students. When it is combined with the walking-through of simulated events, the students gain a more global sense of how language can help or hinder them in their professional lives.

The students' involvement in taking a content course similar to one in an American university provides them with a more intensive experience than the other aspects of the experential forums. Due to the nature of the course, they learn not only about the format and procedures of a course, but they also experience a learning and a problem solving approach not commonly emphasized in Chinese scientific training today.

PARTICIPATION IN A CONTENT COURSE

The Introduction to the Western Philosophy of Science as a content course provides professional cultural orientation in the following three ways:

1. Simulation of a graduate course in teaching methodology and philosophy
2. Introduction to the theory behind a Western approach to science and to the methodology of doing research
3. Experience in using the approach by applying it to the course materials and comparing it to their experiences

Since the first aspect has been mentioned previously, we will address the second two primarily here.

I. Introduction to the theory Behind a Western Approach to Science

The content of the course presents a general overview of the philosophy of science as it exists in the West today. Controversial issues and differing opinions are included. In some ways the Western philosophical approach varies significantly from the philosophical tradition of many of the Chinese scientists; in other ways the two approaches may seem very close with the differences appearing to be no more than the different ways of expressing things. In providing this introduction, there is no intent to argue that one approach is better than another, but rather it is a way of providing more information about the assumptions Western scientists share; therefore, providing survival skills so the foreign scientist can use his/her time more effectively while abroad.

This article discusses the writers' experiences with Chinese scientists and focuses on Chinese and American philosophies; however, we feel this can be applied to other situations with equal success. Philosophical perspectives influence cultures and manifest themselves in many aspects of the society, so these observations may apply to comparisons between any other two cultures equally as well. Although these comments may reflect unconscious value judgements on the parts of the observers, they are not intended. We are bound by our own cultural norms and assumptions and hope only to point up some areas of apparent differences, not to make judgements about what is 'better'.

In the course of presenting material to the students, certain apparent differences in scientific approach were noticed. These observations are tentative ones and should not be considered expert of final, for they come from EFL teachers who are not trained as researchers in the physical sciences although there were many discussions with Western and Chinese scientists and philosophers in the process of generalizing from separate observations. This is an initial attempt to address the issue of what some of these differences might actually be reflecting.

Central to much of this is a comment made by a visiting Chinese philosopher. He postulated the following: "Chinese philosophy is based on the principle of Dogmatism while Western philosophy is based on the principle of Agnosticism or Skepticism." (Li, 1981)

This hypothesis is not merely an interesting intellectual hook to hang conceptions onto; it represents a perspective for identifying the source of frustration that foreign teachers (of language, culture and science) often experience while working in China. It also provides a possible key for Chinese scholars as they try to define some of their problems and areas of frustration experienced while working or studying in Western institutions of science and education.

In numerous discussion with Western researchers, they have stated their perceptions of significant differences:

> If they're going to learn to do research, they must learn to ask questions. I have to set up the training process to include question-asking.
>
> They know the techniques very thoroughly but don't know how to ask the important questions.
>
> They panic when asked their opinions. They'd rather first know what the teacher's opinion is, know what is considered the right answer.
>
> They know the texts in depth. They read the textbook until they know it inside out, but they feel uncomfortable with a system which asks them to read many books for the main ideas, for the general knowledge, and to evaluate conflicting opinions.
>
> They're not accustomed to research designs involving control and experimental groups...not familiar with double blind experiments and tend to be very subjective in their approach to research.

In class and in course evaluations, the Chinese scientists involved have made comments reflecting their recognition of areas of difference and their concerns about the ambiguous quality of the material.

> We think this course is ridiculous since you can't state a correct answer to anything.
>
> I don't want to read journal articles; they all contradict each other. I want a book which will tell me what is the correct thing to do.
>
> How can you test us on the material? You say there is no single correct answer and that you will not deduct credit for grammatical errors - then why don't all the students get A's?
>
> It is nonsense to say that scientists are skeptical and doubt everything. Would all the students who agree with me please raise their hands?

Language teachers have also noted some cultural differences as seen in a paper discussing the influence of Confucious on Chinese education by Scovel (1982).

> When Chinese learn to write expressions for ideas, they learn to employ styles that are considered proper and for which others have received favorable recognition... "creativity" is perceived by the Chinese to flow from disciplin and proficiency. It is believed that once a process becomes mastered through precise repeated practice using praiseworthy models, then originality can emerge within the bounds of discipline. (pp. 5 & 6)
>
> There is a keen interest in an exact understanding of every word, a low tolerance for ambiguity. (Barnhouse 1981 in Scovel 1982, p. 3)

The focus of one system seems to be on the questions and methodology of research, of the other on the answers and practical manipulation of facts. One tends towards an open-ended search and to encourage controversy and differing opinions; the other builds towards evidence in support of something which is already believed to be true (for example, research in China on acupuncture attempts to clarify why it works rather than if it works and how), or to justify the rejection of something which does not fit into the pattern ("We reject the word 'metaphysical'; we believe in the material world, so this term is not correct.").

Good research is done by both groups, and certainly examples of these different approaches to research can be found both in the West and in China. Some Western research projects resemble the dominant Chinese model, and some Chinese research is closely allied to the predominant Western model. Despite the fact that the scientific communities overlap at some points, there does seem to be a dominant pattern in each community which can be identified by students through discussions of philosophical perspectives. Handled sensitively in class, these discussions can be very stimulating to the students without being threatening professionally or politically.

2. Experience in Applying Western Methodology in the Content Course

2.1 Relationship of Philosophy and Educational Approach

A Western trained historian of science with experience in Asia summarized her impressions in this way: A Chinese approach to science education generally means learning a text, learning from lectures, learning the information and applying that knowledge to problems to find solutions. This assumes right and wrong answers. This does not preclude asking questions, but the kinds of questions tend to be more for gaining factual information and for eliciting the right answers than for the purpose of exploring many facets of a problem. The Western approach, on the other hand, generally means learning how to ask questions, learning how to explore material, learning how to formulate and defend one's own answers. This assumes the possiblity of more than one answer but does not preclude the learning of facts as well. (Dugan, 1982)

In an article in the Atlantic Monthly, Lewis Thomas (author of Lives of a Cell and The Medusa and the Snail) discusses science education in the West. His opinion confirms the above, for he says that "the essential lesson to be learned [in science] has nothing to do with the relative validity of facts underlying the argument. It is the argument itself that is the education: we do not yet know enough to settle such [questions of science] questions." (Thomas, 1981)

The Chinese attitudes about education were mentioned by a Chinese engineering professor who "criticized the present teaching method of overemphasizing lectures and not giving the students enough time to read, think and create." (China Daily, 1982) Scovel discusses this and describes the students "as usually listening and reading passively instead of anticipating, guessing, predicting, asking themselves questions, or asking questions of the text." (Scovel, 1982, p.4)

Science education influences dramatically the development of the cultural perspectives on science. Both systems seem to emphasize the learning of facts at the lower levels, but in the more advanced levels of Western study, the emphasis shifts more dramatically to the exploration process itself. On the other hand, at one typical Chinese agricultural university, students "not only memorize English readings, but biology and animal husbandry lectures as well. The professors also deliver their lectures from memory." (Barnhouse, 1981 in Scovel, 1982 p.3)

The developing awareness of the differences in philosophical approaches is intellectually stimulating to the students and provides some preparation for the professional situations they will encounter in Western countries. They develop confidence in discussing abstract concepts in English, feel more confident dealing with ambiguities and differing opinions, and have a more sophisticated notion of some of the terms used in scientific research (theory, law, hypothesis, cause, etc.).

However, knowledge about the Philosophy of Science itself is a rather limited goal, for most students will not engage in lengthy philosophical debates with their Western colleagues. Many scientists in the West aren't themselves trained in formal Philosophy of Science and could not discuss it as content; nevertheless, the approach to research and training in methodology reflect the underlying assumptions of these differing philsophical beliefs, and the terms of philosophy are used frequently in the discussion of science.

Since knowledge of the content is of somewhat limited value and not as meanigful training as actually applying the methodology to a learning situation, the experiencing of the philosophical approach in the classroom is an important aspect of the course. Just as learning the rules about a language does not necessarily prepare a person for using the language effectively, so knowledge about a particular approach to research and education is not the same as working through the process empirically.

Experience in applying Western methodology in the content course:

Additional professional cultural orientation is provided by offering the opportunity of experiencing the Western approach to education in the process of taking the content course. The classroom methods used in the course are based on an American model of education. For example, students are expected to discuss the questions raised by the materials as well as ones they themselves raise. They are asked to apply the concepts to their own experiences, to bring forth examples from their own fields of specialization. They are challenged and expected to defend their propositions with teachers often taking a devil's advocate position to encourage better argumentation and clarification. They are encouraged to argue with the material itself and to debate among themselves the issues raised by the materials.

This experience of abstraction and the process approach to learning material that is ambiguous (in that there are no absolutes or 'correct' answers) is a significantly new kind of experience for many of the students. The material presents basic assumptions about science and procedes to challenge and question them.

This is often a difficult psychological experience (just as studying in Chinese schools is often problematic for many Western students) for several reasons. In the traditional Chinese classroom, students are not accustomed to asking questions. (van Naerrsen, Huang & Yarnall, 1982). When they do ask questions, usually outside of class, it is generally to elicit "correct" answers which students can learn and repeat (although occasionally they do disagree with the professor). One of the students articulated out of class

this before an exam when she said, "We want you to give us the perfect answers so we can learn them for the exam."

Because of this, the notion of the role of the teacher is challenged in discomforting ways. For example, "Everytime we ask a question, we always get a question back. Even the teachers don't know the answers," one student complained. As students develop their relationship with the teacher of the course, they must find a new basis for respecting him/her, for the teacher cannot be viewed primarily as a source of facts. The old basis for respect for the role is gone but has not been replaced with a new obviously 'correct' rationale.

Part of this sheltered*course is helping the students

FOOTNOTE

* "The sheltered subject matter classroom is simply subject matter teaching to a class of second language students...the focus...is on a particular subject..Such a class is not labelled a language class,but is considered a class in a particular subject...students are tested on the content, on the subject matter, and not on language. It is not a "module", not units of topics of interest inserted into a language course, but is a real, not "realistic", course of study...Sheltered subject matter teaching differs from ordinary subject matter teaching in that participation in such classes is limited to second language acquirers." (Krashen 1982, p. 2)

learn how to cope with such anxiety producing situations. For example, exams are given, yet students are in the insecure position of not knowing what the correct answers are. To help with this, questions from previous exams and a selection of student answers are analyzed in Writing class to help students develop a notion of what makes a good answer and of how good answers can have different types of organization, different factual content and different opinions.

DEVELOPMENT OF LANGUAGE SKILLS IN PHILOSOPHY OF SCIENCE CONTENT COURSE

Not only do the Chinese scientists involved in this course discover specific areas in which their training differs from or coincides with the training of scientists in the West, but they apply their language skills to learn new content (Krashen 1982, Bernbrock/1979 Long 1980) and develop a more sophisticated perspective on the limitations and uses of language. In expressing abstract ideas, philosophers themselves have struggled with the problem of determining the trusmeanings of terms; in fact, the discpline of philosophy revolves around that very issue to some extent. Second language students often over-rely on word-by-word translation, but the study of philosophy encourages them to explore the abstractions which are symbolized by words and expressions. Terms must be defined through discussion rather than through dictionaries and translation. This is quite different from past experience and expectations and is an additional cause for anxiety among students who must work through ideas to come up with their common understanding of the abstract ideas represented or expressed with the word. For non-native speakers this challenge can be frustrating, but it is also exciting for them to realize that it is not a culturally determined problem, but rather one intrinsic to the study of philosophy.

CONCLUSION

Philsophies manifest themselves not only in approaches to science and education but also in political and religious systems which reinforce assumptions about the nature of the world, or world view. The differences in approach to science and to the teaching of this course reflect some very fundamental aspects of the cultures involved. The teachers and students of such a course need to be cautious and sensitive in order for the course to provide better information about one another rather than to serve for the conversion of any person or group from one ideology to another.

The value of developing a professional cultural orientation for the students of this center has been proved by the enhanced awareness students have about relevant topics in professional and scientific areas and by their improved ability to discuss and analyze the cultural differences experienced in simulated foreign professional settings.

The two aspects of professional cultural orientation discussed in this paper and the detailed discussion of the sheltered content course taught as a synthesis of the two may serve as a model for the devlopment of other specialized cultural components of ESP programs. Since professional fields are as influenced by cultural assumptions as any other area of life, better understanding of these differences and the theories behind them may enable all of us to achieve more meaningful cooperative results from our work in the attempt to bridge the barriers of language and tradition.

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